

THE CLAIMS

This listing of the current claims, in which no amendments have been made, is provided for convenience:

Listing of Claims

1. - 20. (canceled)

21. (previously presented) A method of fixing bone comprising:

providing a bone plate configured and dimensioned for application to a patient's bone, the plate having an upper surface, a lower surface and at least one opening extending from the upper surface to the lower surface, the opening defining a first axis substantially perpendicular to the upper surface and the opening including a plurality of isolated protrusions formed on an inner surface of the opening, the protrusions configured and dimensioned to have the same pitch and mate with threads on a bone screw head;

applying the bone plate to a patient's bone;

inserting a bone screw through the opening in the bone plate at a selected, variable angle of orientation relative to the first axis, the bone screw having a threaded head portion, the threaded head portion having a double entry; and

tightening the bone screw such that the threaded head portion of the screw mates with one or more protrusions of the inner surface of the opening in the bone plate to lock the screw to the plate at the selected angle relative to the first axis.

22. (previously presented) The method of claim 21, wherein the head of the bone screw is at least partially spherical.

23. (previously presented) The method of claim 21, wherein the bone screw includes a shank portion having threads, and the threads of the shank portion have substantially the same pitch as the threads of the head portion.

24. (previously presented) The method of claim 21, wherein the inner surface of the opening in the plate includes a first area having protrusions and a second area without protrusions and the second area is greater than the first area.

25. (previously presented) The method of claim 24, wherein the inner surface of the opening includes between about 2 and about 30 protrusions.

26. (previously presented) The method of claim 21, wherein the bone screw is self-drilling.

27. (previously presented) The method of claim 21, wherein the bone screw is self-tapping.

28. (previously presented) The method of claim 21, wherein the bone screw has a non-threaded shaft portion.

29. (previously presented) The method of claim 21, wherein the opening of the plate comprises a plurality of frustoconical holes that form an hourglass shape, and each protrusion formed on the inner surface of the opening has a flat shape with a width greater than its length.

30. (previously presented) The method of claim 21, wherein the protrusions are substantially wedge-shaped.

31. (previously presented) The method of claim 21, wherein at least some of the protrusions are symmetrically distributed in a plane along a circumference of the inner surface of the opening.

32. (previously presented) The method of claim 21, wherein the protrusions are distributed in two substantially parallel planes along the inner surface of the opening.

33. (previously presented) The method of claim 21, wherein the angle of orientation of the bone screw relative to the first axis may vary from about zero degrees to about twenty degrees.

34. (previously presented) A method of fixing bone whereby a fixation device having at least one opening is secured to a patient's bone using a threaded bone engaging member, the method comprising:

applying the fixation device to the patient's bone;

selecting an angle of orientation of the bone engaging member relative to the fixation device;

threading the bone engaging member through the opening at the selected angle of orientation with respect to the fixation device;

threading a double-entry threaded head of the bone engaging member onto protrusions formed on an inner surface of the opening, the protrusions configured and dimensioned to have the same pitch and mate with the double-entry threads of the head of the bone engaging member at the selected angle of orientation; and

tightening the bone engaging member to rigidly lock the bone engaging member at the selected angle of orientation with respect to the fixation device without using any additional, separate components at an interface between the bone engaging member and the fixation device.

35. (previously presented) The method of claim 34, wherein the head of the bone engaging member is partially spherical and the bone engaging member includes a threaded shank, and the threads of the head and the shank have substantially the same pitch.

36. (previously presented) The method of claim 34, wherein the protrusions are formed on the inner surface of the opening near the top of the opening.

37. (previously presented) The method of claim 34, wherein the inner surface of the opening in the fixation device includes a first area having protrusions and a second area without protrusions and the second area is greater than the first area.

38. (previously presented) The method of claim 34, wherein the fixation device includes between about 2 and about 30 protrusions.

39. (previously presented) The method of claim 34, wherein the opening of the fixation device comprises a plurality of frustoconical holes that form an hourglass shape, and each protrusion formed on the inner surface of the opening has a flat shape with a width greater than its length.

40. (previously presented) The method of claim 34, wherein the protrusions are substantially wedge-shaped.

41. (previously presented) The method of claim 34, wherein at least some of the protrusions are symmetrically distributed in a plane along a circumference of the inner surface of the opening.

42. (previously presented) The method of claim 34, wherein the protrusions are distributed in two substantially parallel planes along the inner surface of the opening.

43. (previously presented) The method of claim 34, wherein the angle of orientation of the bone engaging member relative to the fixation device may vary from about zero degrees to about twenty degrees.

44. (previously presented) A bone fixation system comprising:
a fixation device configured and dimensioned for application to a patient's bone, the fixation device having an upper surface, a lower surface and at least one opening extending from the upper surface to the lower surface, the opening defining a first axis substantially perpendicular to the upper surface and the opening including a plurality of isolated protrusions formed on an inner surface of the opening, the protrusions configured and dimensioned to have the same pitch and mate with threads on a bone engaging member; and
a bone engaging member configured and dimensioned for insertion through the opening in the fixation device at a selected angle of orientation relative to the first

axis, the bone engaging member having a threaded head portion, the threaded head portion having a double entry;

wherein upon tightening of the bone engaging member, the threaded head portion of the bone engaging member mates with one or more protrusions of the inner surface of the fixation device opening to lock the bone engaging member to the plate at the selected angle of orientation relative to the first axis.

45. (previously presented) The system of claim 44, wherein the fixation device is a bone plate and the bone engaging member is a bone screw.

46. (previously presented) The system of claim 45, wherein the head of the bone screw is at least partially spherical.

47. (previously presented) The system of claim 46, wherein the bone screw includes a shank portion having threads, and the threads of the shank portion have substantially the same pitch as the threads of the head portion.

48. (previously presented) The system of claim 44, wherein the inner surface of the opening in the fixation device includes a first area having protrusions and a second area without protrusions and the second area is greater than the first area.

49. (previously presented) The system of claim 48, wherein the inner surface of the opening includes between about 2 and about 30 protrusions.

50. (previously presented) The system of claim 44, wherein the opening of the fixation device comprises a plurality of frustoconical holes that form an hourglass shape, and each protrusion formed on the inner surface of the opening has a flat shape with a width greater than its length.

51. (previously presented) The system of claim 44, wherein the protrusions are substantially wedge-shaped.

52. (previously presented) The system of claim 44, wherein at least some of the protrusions are symmetrically distributed in a plane along a circumference of the inner surface of the opening of the fixation device.

53. (previously presented) The system of claim 44, wherein the protrusions are distributed in two substantially parallel planes along the inner surface of the opening of the fixation device.

54. (previously presented) The system of claim 43, wherein the protrusions are configured and dimensioned to lock the bone fixation member relative to the fixation device at a variable angle of orientation of between about zero degrees and about twenty degrees.